



AIRCRAFT ACCIDENT REPORT
CAA OCCURRENCE NUMBER 11/829
SCHUTTE SAILS KEA 146 HANG GLIDER
DEPARTURE FROM CONTROLLED FLIGHT
PAEKAKARIKI HILL, WELLINGTON
27 FEBRUARY 2011

Foreword

As a signatory to the Convention on International Civil Aviation 1944 (the Chicago Convention) New Zealand has international obligations in respect of the investigation of accidents and incidents. Pursuant to Articles 26 and 37 of the Chicago Convention, the International Civil Aviation Organisation (ICAO) issued Annex 13 to the Convention setting out International Standards and Recommended Practices in respect of the investigation of aircraft accidents and incidents.

New Zealand's international obligations are reflected in the Civil Aviation Act 1990 (the Act) and the Transport Accident Investigation Commission Act 1990 (the TAIC Act).

Section 72B(2)(d) and (e) of the Civil Aviation Act 1990 Act also provides:

72B Functions of Authority

(2) The Authority has the following functions:

- (d) To investigate and review civil aviation accidents and incidents in its capacity as the responsible safety and security authority, subject to the limitations set out in section [14\(3\)](#) of the [Transport Accident Investigation Commission Act 1990](#):
- (e) To notify the Transport Accident Investigation Commission in accordance with section [27](#) of this Act of accidents and incidents notified to the Authority:

Following notification to the Transport Accident Investigation Commission (the Commission) of any accident or incident which is notified to the Authority, an investigation may be conducted by the Commission in accordance with the TAIC Act. CAA may also investigate subject to the requirements of the TAIC Act.

The purpose of an investigation by the Commission is to determine the circumstances and causes of accidents and incidents with a view to avoiding similar occurrences in the future, rather than to ascribe blame to any person.

CAA however investigates aviation accidents and incidents for a range of purposes under the Act. Investigations are primarily conducted for the purpose of preventing future accidents by determining the contributing factors or causes and then implementing appropriate preventive measures - in other words to restore safety margins to provide an acceptable level of risk. The focus of CAA safety investigations is therefore to establish the causes of the accident on the balance of probability.

Accident investigations do not always identify one dominant or 'proximate' cause. Often, an aviation accident is the last event in a chain of several events or factors, each of which may contribute to a greater or lesser degree, to the final outcome.

CAA investigations may also inform other regulatory-safety decision making or enforcement action by the Director.

In the case of a fatal aviation accident, the final CAA investigation report will generally be highly relevant to an inquiry, and in some circumstances, an inquest, conducted by a Coroner.

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Glossary of abbreviations:

amsl	above mean sea level
C	Celsius
CAA	Civil Aviation Authority
CAR	Civil Aviation Rule(s)
E	east
km	kilometre(s)
MBZ	Mandatory Broadcast Zone
NZDT	New Zealand Daylight Time
NZHGPA	New Zealand Hang Gliding and Paragliding Association
PMO	Principal Medical Officer
S	south
UTC	Coordinated Universal Time
VHF	Very High Frequency (Radio)

Data summary

Aircraft type:	Schutte Sails, Kea 146
Number and type of engines:	Nil
Year of manufacture:	1987
Date and time of accident:	27 February 2011, 1930 NZDT hours ¹ (approximately)
Location:	Paekakariki Hill Latitude ² : S 41° 00' 32.7" Longitude: E 174° 56' 19.3"
Type of flight:	Private
Persons on board:	Crew: 1
Injuries:	Crew: 1 Fatal
Nature of damage:	Hang Glider destroyed
Pilot-in-command's licence	NZHGPA Hang Glider Temporary Student Pilot Certificate, Novice Rating
Pilot-in-command's age	47 years
Pilot-in-command's total flying experience:	40 flights
Information sources:	Civil Aviation Authority Safety Investigation
Investigator in Charge:	Mr D G Foley

¹ All times in this report are NZDT (UTC + 13 hours) unless otherwise specified.

² NZ WGS-84 co-ordinates

Synopsis

On the evening of Sunday, 27 February 2011, the pilot was ridge soaring in moderate westerly winds when he failed to land at a pre-determined landing location on the Paekakariki Beach. A search was initiated which located the hang glider wreckage, the following morning, to the east of the take-off location. The pilot had received fatal injuries.

The Civil Aviation Authority (CAA) was notified of the accident at 0730 hours on Monday, 28 February 2011. The Transport Accident Investigation Commission was in turn notified shortly thereafter, but declined to investigate. A CAA Safety Investigation was commenced the same day.

1. Factual information

1.1 History of the flight

- 1.1.1 On the morning of Sunday, 27 February 2011, the pilot completed the final two flights that were required for him to meet the flight requirement to progress from the hang glider Beginner Rating to, a Novice Rating. These flights were conducted at a known hang gliding location, approximately 5km south-east of Shannon, called Heights Road. They were conducted on a Moyes Mars Hang Glider and were supervised by an Advanced Pilot³.
- 1.1.2 Following the successful completion of the flights and the Novice Rating, the pilots headed for their respective homes.
- 1.1.3 Later that day, at approximately 1730 hours, the Novice Pilot had a meeting with his wife, at their home in Levin. The wife stipulated that when she left, the pilot was 'having a beer [...] and seemed relaxed.'
- 1.1.4 At approximately 1800 hours, the Novice Pilot decided to go for another hang glider flight. He drove to the home of the Advanced Pilot, who joined him on the drive from Manakau, just north of Otaki Township, to the Paekakariki Hill.
- 1.1.5 On the way up the Paekakariki Hill Road, the pilots stopped at the summit car park, where flying conditions and the location of the landing site (Paekakariki Beach) were discussed. This was the first time the Novice Pilot had flown from this location. They then drove and parked at the end of the airstrip located on the north-western ridge on the Paekakariki Hill. See Figure 1.

³ The Advanced Pilot is a former instructor, however, he was not a current instructor at the time of the accident.

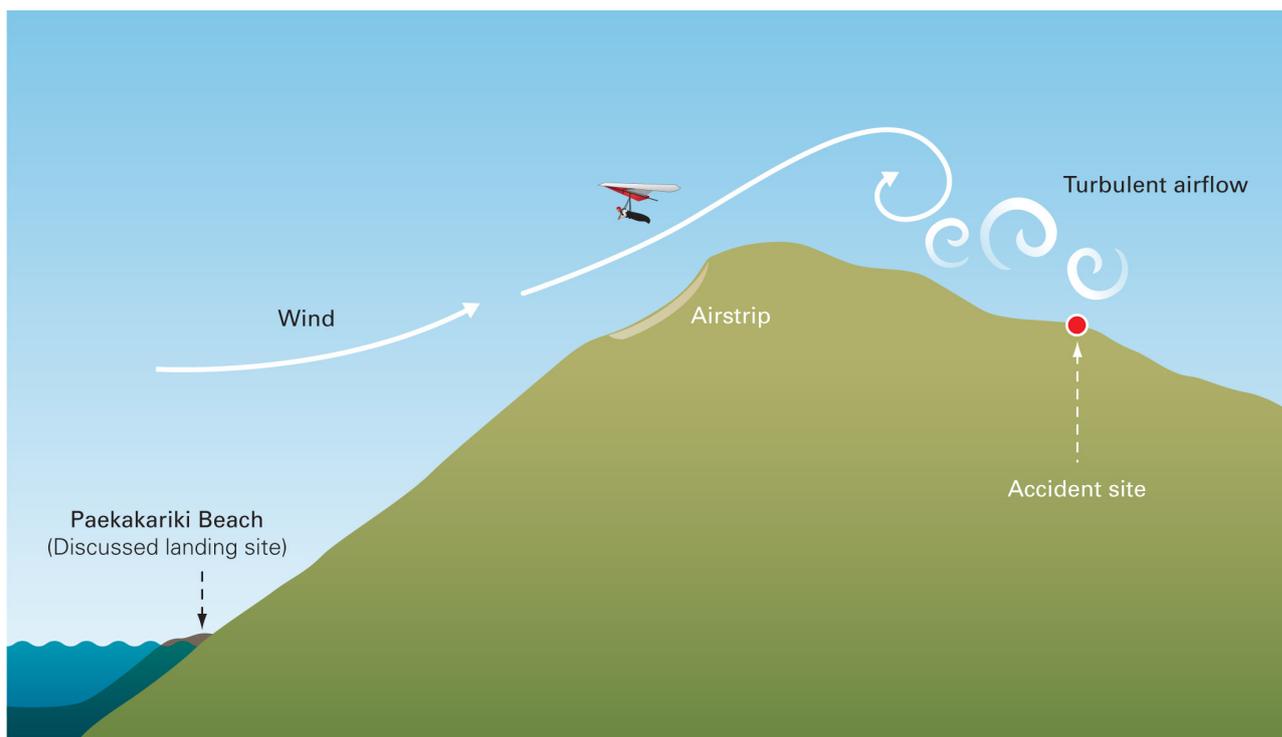


Figure 1
 Cross section representation of the Paekakariki Hill area.
 (For illustrative purposes only)

- 1.1.6 While the pilots were rigging their hang gliders the Novice Pilot asked about “top landings”⁴, The Advanced Pilot, who was supervising the Novice Pilot, gave strict instructions that the Novice Pilot ‘was not to top land in this area as it is very dangerous because of rotor winds⁵, and that even experienced pilots don’t top land’. The Novice Pilot then asked about how they would get from the beach to where his car was located, at the top of the hill. The Advanced Pilot told him they would get a ride up the hill or simply walk up it.
- 1.1.7 This was the first time that the Novice Pilot had flown a Kea 146 Hang Glider, as all of his previous flights had been conducted on a Moyes Mars Hang Glider. It was also the first time that he had “ridge soared.”⁶
- 1.1.8 The Novice Pilot was the first pilot to take off, and was watched by the Advanced Pilot for approximately 10 minutes, prior to him taking off.

⁴ A term used for landing on top of a hill usually from a point where the take-off has occurred from.

⁵ Rotor wind is a closed eddy that forms in the lee of an obstacle in the airflow, and can be an area of severe turbulence. See Figure 1.

⁶ Ridge Soaring is a flight manoeuvre where a hang glider is flown in up-draft along a ridge line. If the wind is strong enough, the ridge lift provides enough upward force for hang gliders to stay airborne for long periods.

- 1.1.9 After a further 15 minutes of both pilots ridge soaring, the Advanced Pilot elected to land on the beach beneath the area that they were currently flying in, to show the Novice Pilot where to land.
- 1.1.10 After landing, the Advanced Pilot looked up to see how the Novice Pilot was doing and noted that he was nowhere to be seen. The Advanced Pilot was expecting to see the Novice Pilot in the general vicinity of the beach, but could not, so he commenced a search of the beach and Paekakariki Hill area.
- 1.1.11 Following an un-successful search, the Advanced Pilot telephoned the New Zealand Hang Gliding and Paragliding Association (NZHGPA) Organisation Safety Officer to advise him of the missing Novice Pilot. He then drove to the Kapiti Police Station to notify the Police. On reaching the Kapiti Police Station and finding it closed, the Advanced Pilot elected to drive home to Manakau at which point he notified the Police, who conducted their own search. The hang glider wreckage and deceased pilot were located early the following morning.
- 1.1.12 The accident occurred in daylight, at approximately 1930 hours, on the Paekakariki Hill, at an altitude of approximately 900 feet amsl. Latitude S 41° 00' 32.7", longitude E 174° 56' 19.3".

1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Other</i>
Fatal	1	0	0
Serious	0	0	0
Minor/None	0	0	

1.3 Damage to aircraft

- 1.3.1 The hang glider was destroyed.

1.4 Other damage

- 1.4.1 Nil.

1.5 Personnel information

- 1.5.1 The pilot commenced hang glider flight training on 12 December 2010. His instructor commented that the pilot 'was very keen to learn and advance'.
- 1.5.2 Between 12 December 2010 and 13 February 2011, the pilot conducted a total of 33 training flights, under the direct supervision of an instructor.
- 1.5.3 On 18 February 2011, the pilot conducted two flights under the supervision of an Advanced Pilot.

- 1.5.4 On 19 February 2011 the pilot conducted three flights under the direct supervision of an instructor.
- 1.5.5 The day before the accident, Saturday 26 February 2011, the pilot spent the afternoon completing and passing his:
- Hang Glider Beginner Certificate,
 - Hang Glider Novice Certificate, and
 - Visual Flight Rules Exam Form.
- These three examinations were conducted under the supervision of the Organisation Safety Officer, and followed the NZHGPA's Organisation and Procedures Manual, Training section.
- 1.5.6 Also on the same day, the pilot completed a New Pilot Membership Application Form, along with a Fit and Proper Person Questionnaire.
- 1.5.7 The Fit and Proper Person Questionnaire requires applicants to declare, amongst other things, whether the applicant has been convicted in a court of law for any transport safety offences in the last five years. The pilot declared that he had been convicted of 'drink driving'.
- 1.5.8 As the pilot had only completed 38 of the 40 required training flights⁷, the Organisation Safety Officer stipulated that he would withhold sending the exam results and application forms into the NZHGPA until the 40 flight pre requisite had been met.
- 1.5.9 On Sunday 27 February 2011, under the supervision of the Advanced Pilot, the pilot conducted the final two flights to satisfy the 40 flight requirement to progress from a Beginner Rating, to Novice Rating.
- 1.5.10 According to the NZHGPA, at the time of the accident, the pilot had achieved his Hang Glider Novice Rating, while operating on a Temporary Student Pilot Certificate. However this is not in accordance with their Organisation and Procedures Manual, Training section, which stipulates that: *'A marked and signed copy of the candidate's answers is to be sent to the administrator along with a correctly completed and current rating form in order that the examined rating can be issued'*.
- 1.5.11 During the course of the CAA safety investigation, the NZHGPA was requested to review the pilot's flight training records. The records contained in the Pilot's Logbook, were considered sufficient, by the NZHGPA, for the pilot to meet the Novice Rating.

7 A 'flight' is deemed by the NZHGPA to be of any duration where the pilot's feet are not in contact with the ground.

1.6 Aircraft information

- 1.6.1 The Schutte Sails, Kea 146 Hang Glider, was made in 1987 by the hang glider designer. It was one of two that were used as prototypes for future designs. Limited information was available from the designer, however, the safety investigation concluded that at the time of accident, the hang glider was within its maximum all up weight limitations.
- 1.6.2 The hang glider comprises of an aluminium alloy frame with a fabric wing. The pilot is enclosed in a harness suspended from the alloy frame, and controls the hang glider by shifting body weight in opposition to a control frame.
- 1.6.3 The pilot purchased the hang glider, second hand, from the Organisation Safety Officer, on 9 February 2011. At this time the hang glider underwent a pre-sale warrant of fitness (WOF) inspection, conducted by the Organisation Safety Officer.
- 1.6.4 The hang glider failed the WOF inspection, as several faults/defects were noted on the hang glider WOF inspection form. These were:
- Repairs required to the keel pocket and bottom surface zip attachment,
 - Replace the A-frame and nose bolts and nuts.
- 1.6.5 Also noted on the WOF inspection form, which was to be rectified before the hang glider was to be flown, was to 'replace the main flying wires'. The WOF form further stated that once rectified the pilots instructors must re-inspect and test fly the hang glider. No record, or evidence, of this being conducted was found during the safety investigation.
- 1.6.6 However, despite the hang glider failing it's WOF inspection, and against the advice of the Organisation Safety Officer, the pilot proceeded with the purchase insisting that he take possession of it that day.
- 1.6.7 Information was received that this was the second time in six months that the pilot had purchased a hang glider without a current WOF. In October 2010, the pilot purchased a Magic IV 166 hang glider, through Trademe, which had not received a WOF in ten years. The pilot presented this to the Organisation Safety Officer for a WOF, subsequently failing. The Organisation Safety Officer described the hang glider as being in a seriously deteriorated, un-airworthy and uneconomic to repair condition.

1.7 Meteorological information

- 1.7.1 On the day of the accident the automatic weather station at Paraparaumu Aerodrome recorded the wind direction as 340 degrees magnetic, at 10 knots with a temperature of 18 degrees Celsius. The routine weather report (METAR) for

Wellington Aerodrome recorded the wind direction as 330 degrees magnetic at 16 knots. It also recorded the Mt Kaukau⁸ wind as 340 degrees magnetic at 25 knots.

- 1.7.2 The Advanced Pilot indicated that the conditions at the airstrip on the Paekakariki Hill were as follows: 'The wind strength was about 18 to 20 knots. It was blowing from the south end of Kapiti Island.' In his experience the 'wind [...] and conditions were perfect.'
- 1.7.3 The NZHGPA Organisation and Procedures Manual, Training section, stipulates that a Novice Rated Pilot is restricted to 'flying in wind speeds of less than 17 knots'. This upper wind restriction is placed on Novice Rated Pilots mainly for flight operational reasons.
- 1.7.4 Interpretation of the weather and analysis of the local effects of topography were sought from the MetService of New Zealand concluded that; in the area which the hang glider wreckage was located '*rotor and downwash conditions east of the ridge (where the up-slope flow separates from the ground surface) were probably severe and unpredictable making that zone unflyable.*'

1.8 Aids to navigation

- 1.8.1 Nil.

1.9 Communications

- 1.9.1 Neither of the pilots were carrying a VHF radio, and as they were operating within the Paraparaumu MBZ (B680) they were required to do so and broadcast position and intentions every 10 minutes. No communications were received from either pilot.

1.10 Aerodrome information

- 1.10.1 Nil.

1.11 Flight recorders

- 1.11.1 Although no flight recording devices were installed on the hang glider, video footage of the pilots second day of training, taken from the ground, was analysed by NZHGPA staff. The NZHGPA expressed the view that: the pilot 'appears to be progressing well for day two of the training. Looks professionally done with [the] use of tethers, instructor at take-off and an assistant at the bottom'.

1.12 Wreckage and impact information

- 1.12.1 The hang glider was located by Police, on the eastern side (leeward⁹) of a small spur, approximately 400 metres south-east of the airstrip, which had been used for the take-off.

⁸ The Mt Kaukau wind in Wellington is used to indicate wind strength and direction at a slight elevation.

⁹ The leeward side, is the downwind side of an object.

- 1.12.2 Due to environmental conditions on the day, the Police Officers on site were requested to photograph the hang glider and then move it to a CAA secure storage facility.
- 1.12.3 Several days later the site was examined with the Police Officers that had attended the accident. This site examination and a detailed examination of the hang glider, occurred in conjunction with the NZHGPA Hang Gliding Operations Manager.
- 1.12.4 The hang glider wreckage was contained in a small area, and all components were accounted for at the accident site. There was a moderate amount of disruption and general tangling of the hang glider. The hang glider was facing in a south-westerly direction, on an increasingly downward slope of approximately 26 degrees.
- 1.12.5 The spreader bar connecting plates located in the centre of the wing were twisted approximately 60 degrees in an anti-clockwise rotation. However, subsequent analysis of the photographs taken by the Police show that this damage occurred during the transportation of the wreckage from the accident site, and not as a result of the accident.
- 1.12.6 The keel tubing had broken in four separate places. Of particular note was the aft section which contained a moderate amount of dirt, which had been forced 200 mm into the tubing. Police photographs show that this aft section was found impaled into the ground in a near vertical orientation. This was the only ground contact witness mark on the hang glider. All four fractures of the keel tubing exhibited compression signatures consistent with being under a longitudinal load at the time of the failure. This indicates that, at the final stage of the accident sequence, the hang glider impacted the ground with the trailing end of the keel post.
- 1.12.7 The Police photographs also revealed that the pilot's left leg was not contained within the harness assembly as it would be for normal flight, it was out of the harness, in the position normally associated with take-off and landing.
- 1.12.8 The A-frame structure and flying wires were all intact and showed no indication of an in-flight failure.

1.13 Medical and pathological information

- 1.13.1 Post-mortem examination showed that the pilot died of injuries consistent with a high-energy impact.
- 1.13.2 There were no indications of any pre-existing medical conditions that could have resulted in the incapacitation of the pilot.
- 1.13.3 Toxicology tests were conducted on the pilot. These were conducted by Environmental Science and Research (ESR) and Wellington Regional Hospital Laboratory. The ESR toxicology samples recorded a blood alcohol level of 73 milligrams of alcohol per 100 millilitres of blood, a little below that permitted for

an adult to drive in New Zealand¹⁰. The Wellington Regional Hospital Laboratory sample recorded a blood alcohol level of 92.2 milligrams of alcohol per 100 millilitres of blood, a little above that permitted for an adult to drive in New Zealand.

1.13.4 The Pathologists considered the level of alcohol in the blood equated to ‘a state of mild intoxication at the time of death.’

1.13.5 There was no evidence of any other commonly used or abused drugs.

1.14 Fire

1.14.1 Fire did not occur.

1.15 Survival aspects

1.15.1 Although the pilot was wearing a helmet, the accident was not survivable.

1.15.2 Located in a pouch on the front of the pilot’s harness was a reserve parachute. The reserve parachute, pouch and deployment system showed no sign of an attempted, or actual, in-flight deployment.

1.15.4 Although there was a delay in locating the hang glider wreckage and the pilot, the injuries sustained by the pilot, in the view of the Pathologist ‘were not survivable even if expert medical attention had been immediately on hand.’

1.16 Tests and research

1.16.1 In light of the pilot’s disclosure on the Fit and Proper Person Questionnaire, and the toxicology results, his previous record of convictions were obtained from the Ministry of Justice and revealed that the pilot had the following convictions in New Zealand:

- 1982 convicted and charged for being a minor in a bar,
- 1983 disqualified from driving, for driving with excess blood alcohol,
- 2000 disqualified from driving, for driving with excess blood alcohol,
- 2009 disqualified from driving, for driving with excess blood alcohol, and
- 2009 convicted of driving, while disqualified for driving with excess blood alcohol.

¹⁰ In New Zealand it is illegal to drive, if you have consumed more than the legal alcohol limit, which is 80 milligrams per 100 millilitres of blood.

1.16.2 A review of literature on the effects of drinking and flying found a paper produced by the Federal Aviation Administration Civil Aerospace Medical Institute Aeromedical Education Division. The paper makes the following points:

- The majority of adverse effects produced by alcohol relate to the brain, the eyes, and the inner ear, which are three crucial organs to a pilot while flying.
- Brain effects include impaired reaction time, reasoning, judgement, and memory. Alcohol decreases the ability of the brain to make use of oxygen.
- Visual symptoms include eye muscle imbalance, which leads to double vision and difficulty focusing.
- Inner ear effects include dizziness and decreased hearing perception.

1.17 Organisational and management information

1.17.1 Hang gliding activities in New Zealand are administered by the NZHGPA.

1.17.2 The Director of Civil Aviation delegates his authority to issue Pilot Certificates to a nominated senior person in a Part 149 Certificated Recreational Aviation Organisation. The NZHGPA, as a Part 149 Recreational Aviation Organisation, is certificated by the CAA to administer the issue of Pilot Certificates by the individual delegation holder.

1.17.3 Even so, pilots of hang gliders must comply with the requirements stipulated in Civil Aviation Rules (CAR).

CAR, Part 91 *General Operating and Flight Rules* sets out the General Operating and Flight Rules for all pilots. CAR, Part 19 *Transition Rules* is a compilation of rules that are in transition, while CAR, Part 106 *Hang Gliders Operating Rules* sets out the operating rules for hang gliders.

1.17.4 CAR, 106.17 Aircraft maintenance, states that: *‘Each person operating a hang glider shall ensure that the hang glider has a current warrant of fitness issued by a hang gliding organisation in accordance with the procedures authorised by the organisation’s certificate’.*

1.17.5 CAR, 19.7 Intoxicating liquor and drugs states that: *‘No crew member while acting in his or her official capacity shall be in a state of intoxication or in a state of health in which his or her capacity so to act would be impaired by reason of his or her having consumed or used any intoxicant, sedative, narcotic, or stimulant drug or preparation’.*

1.17.6 Along with the requirements to comply with CARs, pilots of hang gliders are also required to comply with the operating standards and procedures set out in the NZHGPA Organisation and Procedures Manual.

1.17.7 The NZHGPA Organisation and Procedures Manual, Code of Practice section stipulates that a person being trained to fly a hang glider in New Zealand; *‘Not be under the influence of drugs or alcohol’.*

- 1.17.8 As part of the safety investigation, the Medical Declaration Certificate section of the Temporary Student Pilot Certificate Application was sought, however, the NZHGPA were not able to locate this document. The Medical Declaration Certificate requires the applicant to declare, amongst other things, whether they have a history of alcohol or drug addiction.
- 1.17.9 The NZHGPA were able to provide a copy of the New Pilot Membership Application form, which also contained a similar Medical Declaration. On that form the pilot declared that he did not have a ‘medical condition, disease or disability, either mental or physical [...] which would be likely to affect [his] ability to fly a glider safely’.

1.18 Additional information

- 1.18.1 Nil

2. Analysis

- 2.1 Evidence gathered by the safety investigation indicates that the accident occurred as a result of the hang glider being unable to be recovered in the height available after a departure from controlled flight.
- 2.2 The departure from controlled flight was likely initiated by:
- a. a mishandled manoeuvre, or
 - b. entering an area of rotor or inconsistent airflow.
- 2.3 It is most likely that the departure from controlled flight occurred while the pilot was attempting to ‘top land.’ Factors in support of this determination include:
- The location of the hang glider wreckage, downwind of the location that an intentional ‘top landing’ approach was likely to be conducted,
 - The position of the pilot’s left leg, in the take-off and landing position,
 - The conversation between the Novice Pilot and the Advanced Pilot about conducting a ‘top landing’ and the possible logistics associated with retrieving the car, and
 - The timing of the accident; as the Advanced Pilot headed down to land on the beach, would have been a message for the Novice Pilot to also land.
- 2.4 No evidence of an actual or attempted deployment of the reserve parachute was found. A reasonable explanation for this, is that the departure from controlled flight occurred suddenly; with little altitude, left no time for the Novice Pilot to deploy the reserve parachute.
- 2.5 Although the safety investigation could not conclusively establish how the hang glider arrived at the accident site, evidence suggests that at the final stage of the accident sequence the hang glider impacted the ground heavily with the trailing

end of the keel post. This indicates that at this point, the hang glider was travelling backwards slightly inverted.

- 2.6 The NZHGPA Organisation and Procedures Manual Training section, stipulates that a Novice Rated pilot is restricted to 'flying in wind speeds of less than 17 knots'. It is likely that the flight took place at or above this upper wind restriction.
- 2.7 The report commissioned from the MetService of New Zealand indicated that rotor and downwash conditions east of the ridge were probably severe and unpredictable making this area unflyable. For the hang glider to arrive at the accident scene, it would have flown through this area and likely encountered rotor wind and downwash.
- 2.8 The day before the accident the pilot had completed his Hang Glider Beginner and Novices Rating theory examinations. In the examination, questions were posed about wind flow and turbulence that would be expected when operating in the lee of a hill (rotor wind), or a physical object (mechanical turbulence). The pilot correctly answered these examination questions. It can be concluded that he was aware of the possibility of rotor wind and inconsistent airflow in the area east of that used for take-off (downwind), see Figure 1. This knowledge coupled with the conversation that the Novice Rated Pilot had with the Advanced Pilot about top landings and rotor winds, suggests the pilot made an informed, deliberate decision, to operate in this area. This was apparently contrary to the instructions given by the Advanced Pilot.
- 2.9 The Pathologist concluded that the pilot was 'mildly intoxicated' at the time of the accident, due to the level of alcohol in the blood.
- 2.10 A review of the toxicology results was sought from the CAA Principal Medical Officer (PMO), who agreed with the Pathologist's findings and stipulated that 'there is no level of blood alcohol elevation that is compatible with safe aviation, even the slightest increase in blood alcohol leads to levels of measurable impairment'.
- 2.11 The PMO, expressed the view that such intoxication with alcohol could be expected to adversely influence, or impair, many aspects of the pilot's ability to fly safely, including his judgement, reasoning, decision making, reaction time, coordination, and memory.
- 2.12 While it is possible to conclude that the pilot's intoxication may have had some impact on his abilities as a pilot, it was not possible to establish what level of impairment the pilot would have been suffering at the time of the accident.
- 2.13 Information was provided to the PMO about the frequency and volume of alcohol that the pilot would consume, in order to ascertain whether the pilot had an alcohol dependency. In order to be classified as having an alcohol dependency, according to the Diagnostic and Statistical Manual of Mental Disorders, fourth

edition¹¹, three or more cardinal features need to be present during a 12 month period. Using the criteria stipulated in the manual, the pilot showed signs of five of the seven criteria, which indicated that the pilot had an alcohol dependency. The pilot had not disclosed, to the NZHGPA, that he may have suffered from alcoholism in his Medical Declaration.

- 2.14 The PMO expressed the view that, one of the common features of alcohol dependency is denial. As such a ‘person may not be likely to declare or even allude to their alcohol dependency.’ This being the case a CAA Safety Action (CAA 13F95) has been raised recommending that the CAA and the NZHGPA review the process of medical self declarations for recreational pilots, who belong to a Part 149 organisation that issues pilot certificates.
- 2.15 A review of the pilot’s New Zealand previous convictions indicates that the pilot had multiple convictions associated with alcohol, accumulated between 1982 and 2009.
- 2.16 The purpose of considering convictions is that they are a useful tool for the CAA in identifying patterns in respect of an individual’s use of alcohol. However, any conviction can only tell a limited story, as they only record those occasions on which an individual is actually caught and processed through the judicial system. Although there was no particular pattern with the pilot’s convictions in this case, the number of convictions suggests an inappropriate attitude towards alcohol and transport safety over a long period of time. It is conceivable that the convictions attributed to the pilot do not accurately reflect the frequency and propensity of the pilot’s past use of alcohol and the pilot’s attitude to the compatibility of that use with the operation of a vehicle, and possibly in his flying activities.
- 2.17 Ultimately the convictions add to a picture of the pilot which suggests that he may have had an alcohol dependency, and in this case mixed alcohol with flying.
- 2.18 This accident highlights the importance of the individual performing a comprehensive self-assessment on fitness and suitability to conduct a flight. It underscores that while the CARs set the minimum standards for entering, and operating within, the civil aviation system, it is in the best interests of all aviation participants to perform to a standard above the minimum. Where a person deliberately or consciously departs from those minimum standards, the risk to the safety of the participant is likely to increase.
- 2.19 With reference to the NZHGPA Organisation and Procedures Manual, Training section, Temporary Student Member Pilot Certificate, the Restrictions section stipulates that: ‘*A pilot holding a Temporary Student Member Pilot Certificate of the NZHGPA is restricted to operate a hang glider or paraglider under the direct supervision of an instructor for the purpose of training.*’

¹¹ The Diagnostic and Statistical Manual of Mental Disorders, published by the American Psychiatric Association, provides a common language and standard criteria for the classification of mental disorders.

- 2.20 The NZHGPA stipulate that training is being conducted when new technical skills are being introduced and this needs to be conducted by an instructor. The NZHGPA also stipulate that where practice for the purpose of consolidation is being conducted, where no new technical skills are being introduced, this can be conducted under the supervision of an Advanced Pilot.
- 2.21 The flights conducted on 18 February 2011 were deemed by the pilot's instructor to have been for the purpose of training, and therefore, should have been conducted under the direct supervision of an instructor. However, these were not, they were conducted under the supervision of the Advanced Pilot.
- Despite this fact, the NZHGPA deemed that the pilot had met all of the pre-requisites for advancing from a Beginner Rating to a Novice Rating. It should be noted, that this is inconsistent with the NZHGPA Organisation and Procedures Manual. However, the status of the rating was not deemed to be a contributing factor in this accident.
- 2.22 The pilot had conducted all of his previous flying on a Moyes Mars Hang Glider. The accident flight was the first time that the pilot had flown the Kea 146 Hang Glider. It was also the first time that the pilot had ridge soared and flown at this location. Although the pilot had been ridge soaring successfully for approximately 15 minutes, he had little handling experience, and had never conducted an approach or landing in this type of hang glider. Introducing a new type of hang glider at the same time as conducting a new air exercise, at a new location, is not common practice in the aviation industry, and is not a prudent course of action for a pilot with limited experience.
- 2.23 As ridge soaring was a new technical skill for the pilot, it should have been conducted under the direct supervision of an instructor.
- 2.24 It is a Civil Aviation Rule requirement to carry and use a VHF radio while operating in a MBZ. The lack thereof left no form of communication between the Advanced Pilot and the Novice Pilot if guidance was sought while flying.
- 2.25 Although the hang glider had several deficiencies noted during its pre-sale WOF inspection, none of these are considered to have been contributing factors in this accident. However, as the hang glider did not have a WOF, it was deemed un-airworthy and in non-compliance with CARs.
- 2.26 The safety investigation made an observation that although the NZHGPA stipulate that a new WOF needs to be completed if a hang glider is sold, there is no direction given as to when this is to be conducted. Nor is there any consideration given to the selling of a hang glider that doesn't meet the WOF standard. A CAA Safety Action (CAA 13F94) has been raised recommending that the CAA and the NZHGPA review the process of conducting and issuing of WOFs.
- 2.27 In regards to the process of pilot membership and evaluating whether a person is deemed 'Fit and Proper'; the pilot had been operating under a Temporary Student Pilot Certificate since the commencement of his hang glider training. The NZHGPA only require members to undergo a Fit and Proper Person assessment

when they apply for a New Pilot Membership. It is therefore possible that a pilot operating under a Temporary Student Pilot Certificate may operate without having to declare any previous convictions. This is in contrast to other recreational organisations, who conduct a Fit and Proper Person assessment at the commencement of training, or before the first rating/certificate is issued.

As the pilot had been operating under a Temporary Student Pilot Certificate, he was not required to disclose previous convictions for driving with excess blood alcohol. A CAA Safety Action (CAA 13F95) has been raised recommending that the CAA and the NZHGPA review the process of issuing pilot certificates, focusing in particular on the processes and timeliness of the Fit and Proper Person Declaration and administration of this function.

2.28 The pilot did disclose that he had a drink driving conviction on the Fit and Proper Person Questionnaire, however, this was only completed the day before the accident. The Organisation Safety Officer advised that he questioned the pilot about this and the pilot responding that he 'only had one historic drink driving conviction'. He further stated to the Organisation Safety Officer that he was 'not an alcoholic'.

2.29 Although, in the view of the Pathologist, the accident was not survivable, the safety investigation believes that notifying search and rescue personnel more expeditiously may have been prudent. The NZHGPA Organisation and Procedures Manual stipulates that when a pilot is missing, a search by those at the site is to commence and be conducted and last 180 minutes. If the pilot is not located at this point then the Police and CAA are to be notified.

Although the Advanced Pilot initially followed the missing person procedure, he did not search for 180 minutes, because of the onset of darkness. At approximately 2000 hours, he used a passer-by's mobile telephone to contact the Organisation Safety Officer who advised him to complete his search, and then to call the Police and inform them of the missing pilot. Due to the Advanced Pilot lacking any mobile communications, a delay in advising the Police then occurred. This involved the Advanced Pilot driving from the Paekakariki Hill to the local Police Station, which was unmanned, and then to his home in Manakau. At approximately 2230 hours the Police were notified of the missing pilot. A CAA Safety Action (CAA 13F98) has been raised recommending that CAA and the NZHGPA review the missing person procedure.

3. Conclusions

- 3.1 The pilot had not completed the required training to achieve his Novice Rating in accordance with the NZHGPA Organisation and Procedures Manual.
- 3.2 In issuing the pilot with a Novice Rating, the NZHGPA had not followed their Organisation and Procedures Manual.
- 3.3 The hang glider was sold and subsequently operated while not airworthy and not in compliance with CARs.
- 3.4 The pilot was operating in a MBZ without VHF radio communications.
- 3.5 The pilot had not disclosed to the NZHGPA, that he may have suffered from alcoholism.
- 3.6 It is unlikely that a person with an alcohol dependency would disclose this condition.
- 3.7 At the time of the accident the pilot was under the influence of alcohol.
- 3.8 Introducing a new type of hang glider at the same time as conducting a new air exercise, at a new location, was not a prudent course of action for a pilot with limited experience.
- 3.9 As ridge soaring was a new technical skill for the pilot, it should have been conducted under the direct supervision of an instructor.
- 3.10 The pilot appears to have attempted to “top land” contrary to the instructions of the Advanced Pilot.
- 3.11 During an attempt to do a ‘top landing’ the hang glider departed controlled flight and struck the ground.
- 3.12 It is considered that if the advice given by the Advanced Pilot had been followed, not to top land, it is likely that the accident would not have occurred.
- 3.13 The pilot was likely to have been operating at or above the restricted wind speed of 17 knots, a limitation placed on all Novice Rated Pilots by the NZHGPA.
- 3.14 Rotor winds and downwash in the area associated with a top landing were probably severe and unpredictable, making it unflyable.
- 3.15 While there was delay in locating the hang glider wreckage and the pilot, the accident was not survivable.

4. Safety actions

- 4.1 A CAA Safety Action (CAA 13F94) has been raised recommending that the CAA and the NZHGPA review the process of conducting and issuing of WOFs. In particular focussing on clear instructions about the point in time when WOFs are to be completed in a sale process, and the process where a hang glider with defects is sold without a WOF.
- 4.2 A CAA Safety Action (CAA 13F95) has been raised recommending that the CAA and the NZHGPA review the process of medical self declarations for recreational pilots, who belong to a Part 149 organisation that issues pilot certificates.
- 4.3 A CAA Safety Action (CAA 13F95) has been raised recommending that the CAA and the NZHGPA review the process of issuing pilot certificates, focusing in particular on the processes and timeliness of the Fit and Proper Person Declaration and administration of this function, in light of the observations made in this report.
- 4.4 A CAA Safety Action (CAA 13F98) has been raised recommending that the CAA and the NZHGPA review the missing person procedure, with consideration being given to reducing the time period to wait before notifying Police and other emergency services, in certain circumstances, of a missing person.

Report written by:

Authorised by:

Mr D. G. Foley
Safety Investigator
Date 14/12/2012

Mr B Smith
Manager Safety Investigation

Civil Aviation Authority of New Zealand
Level 15, 55 Featherston Street, Wellington
PO Box 3555, Wellington 6140
NEW ZEALAND
Tel: +64-4-560 9400 Fax: +64-4-569 2024
www.caa.govt.nz